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# Experiments

Experiments with

G. W. Green

1949



## EXPERIMENTS WITH FERTILIZERS

By W. C. Davis

As the question of potash, phosphorus and lime is of much importance to southern planters, the State Experiment Station, New York, very kindly furnished me with amounts of fertilizers to be used on my experiments.

Acid Phosphate

Nitrate of Soda

Muriate of Potash

Sulphate of Potash

Total . . .

The soil used in this experiment was that of a field, that had been "cropped" year after year in the native tenant system, until it was deficient physically and chemically. So much so that cow peas would not grow successfully upon it.

As to situation, it might be termed to be a loamy and sandy in texture, with yellow clay subsoil, with a small excess of sand, which is favorable to the growth of sweet potato.

### PREPARATION OF THE SOIL

Blount's Two-horse Daisy Turning Plow was used to turn the earth turned upside-down (not set up on edge) to a depth of eight or nine inches. A good harrow was now put upon it and harrowed both ways thoroughly; then re-plowed with a light plow, harrowed and re-harrowed, until practically every clod was mashed and a deep, mellow seed bed made.

This eight or nine inches of mellow soil permitted the water to penetrate it quickly, and very materially increased its power for holding water, and almost completely overcame the destructive washes which are so frequent in soils of this character.







POLY(1,4-BUTYLIC BIS(4-VINYLPHENYL))

Rain had not fallen in any appreciable amount in June, rendering the soil dry to a depth of three inches. In addition, the days were extremely hot, and cloudy.

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A hole was dug in the earth sufficient to hold two or three bushels of weeds, a thin mortar was made, made stay to this mortar as it holds moisture longer and adheres to the plants better. The root of each plant was dipped into this thin mud, a row of 50 or 60 dipped plants were ready to be set. This took no work more than required by a favorable season. One boy with his pick hatchet and spade the dry earth away down to the stone was picked number 180 and dropped the well around it from the way back, in which they were carried, a basket



BRIDGEPORT, CONNECTICUT, 1873.

The plots were all one-tenth of an acre and received the same amount of fertilizer indicated in the plan. (See plots, pages 6 and 7.) The plots were separated from one another. The plowing, setting and harvesting were all done in exactly the same for each plot. There were twenty plants in each row in the first plot and sixty-five plants set in each row.







50 lbs. Acid Phosphate  
12 " Nitrate of Soda  
200 " Lime.

12 lbs. Muriate of Potash  
20 " Nitrate of Soda  
200 " Lime.

60 lbs. Acid Phosphate  
20 " Nitrate of Soda  
200 " Lime.

5a  
50 lbs. Acid Phosphate  
12 " Muriate of Potash  
20 " Nitrate of Soda  
200 " Lime.

6a  
60 lbs. Acid Phosphate  
24 " Muriate of Potash  
20 " Nitrate of Soda  
200 " Lime.

7a  
60 lbs. Acid Phosphate  
24 " Sulphate of Potash  
20 " Nitrate of Soda  
200 " Lime.

8a  
200 lbs. Lime.











NO FERTILIZER.

Yield 40 bushels per acre.

Sold for 25 cents per bushel—so inferior.

Net gain \$2.50.



60 LBS. ACID PHOSPHATE.

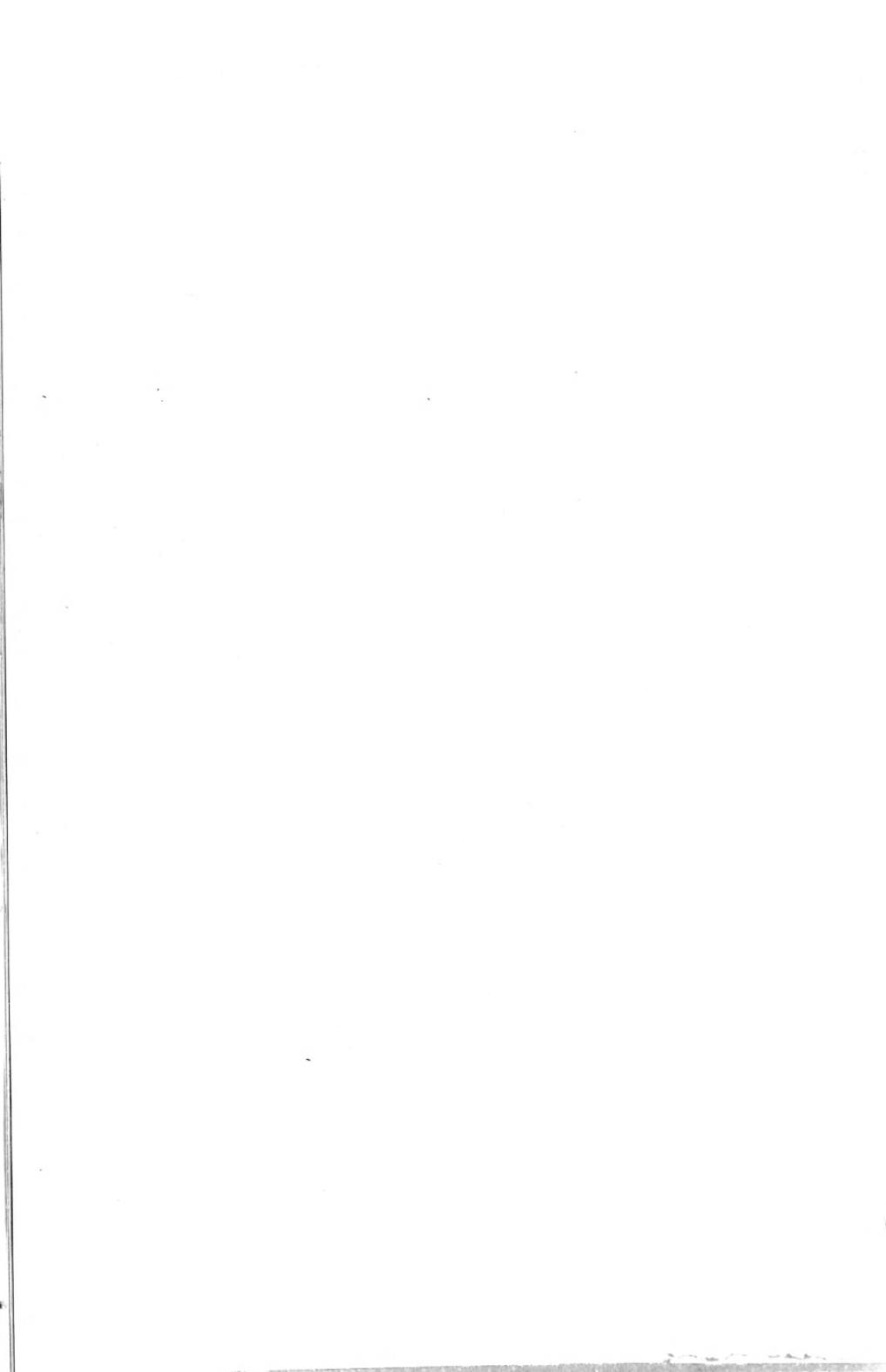
12 " MURIATE OF POTASH.

Yield 266 bushels per acre.

Sold at 50 cents per bushel.

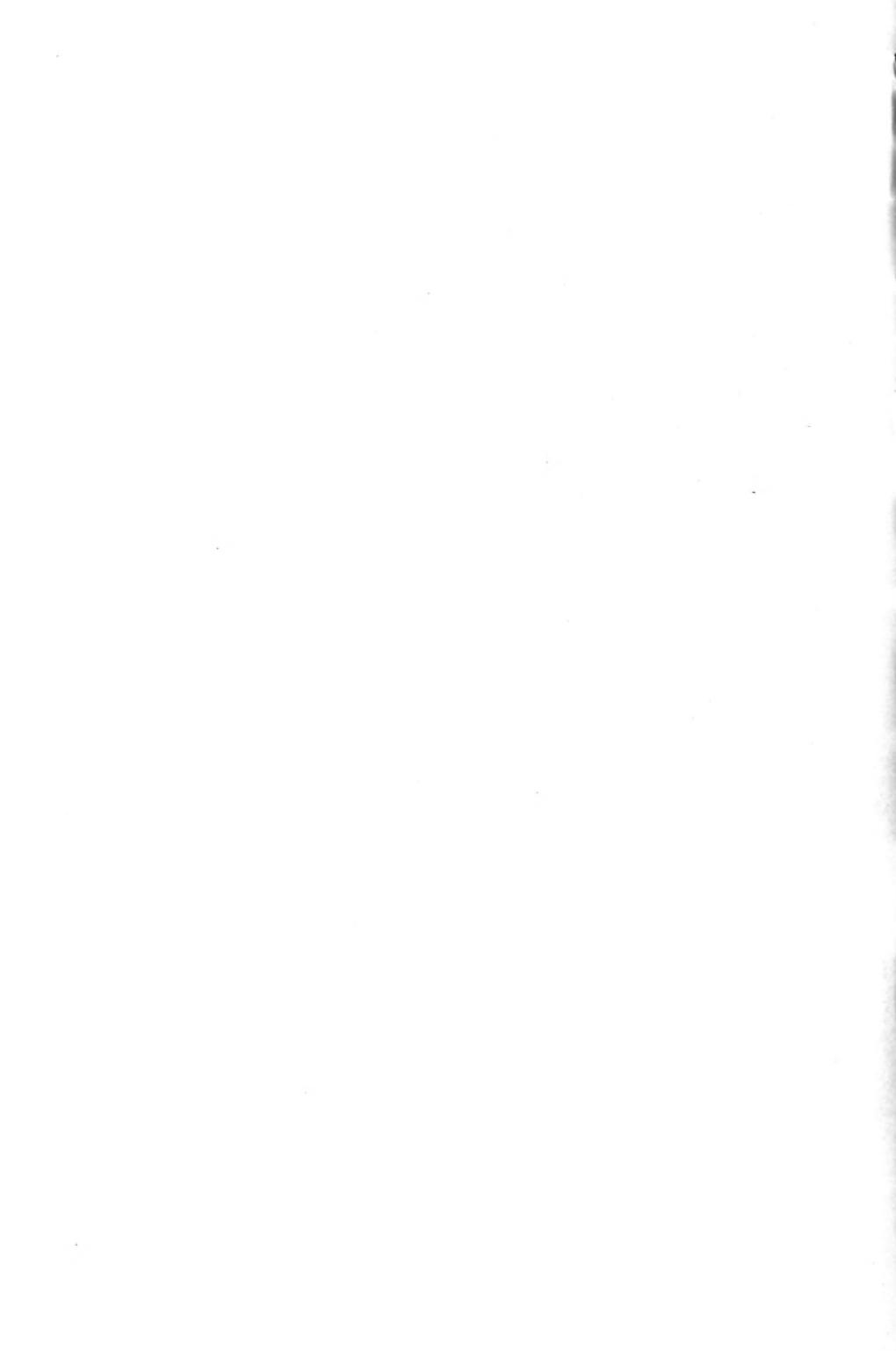
Net gain \$191.150.40







12 lbs. Muriate of Potash.  
20 " Nitrate of Soda.  
Yield 165.5 bushels per acre.  
Sold at 50 cents per bushel.  
Net gain \$275.67.76



It is evident that the plants are not properly fertilized, and 2, the costs of labor, seed, tools, etc., for proper fertilization.

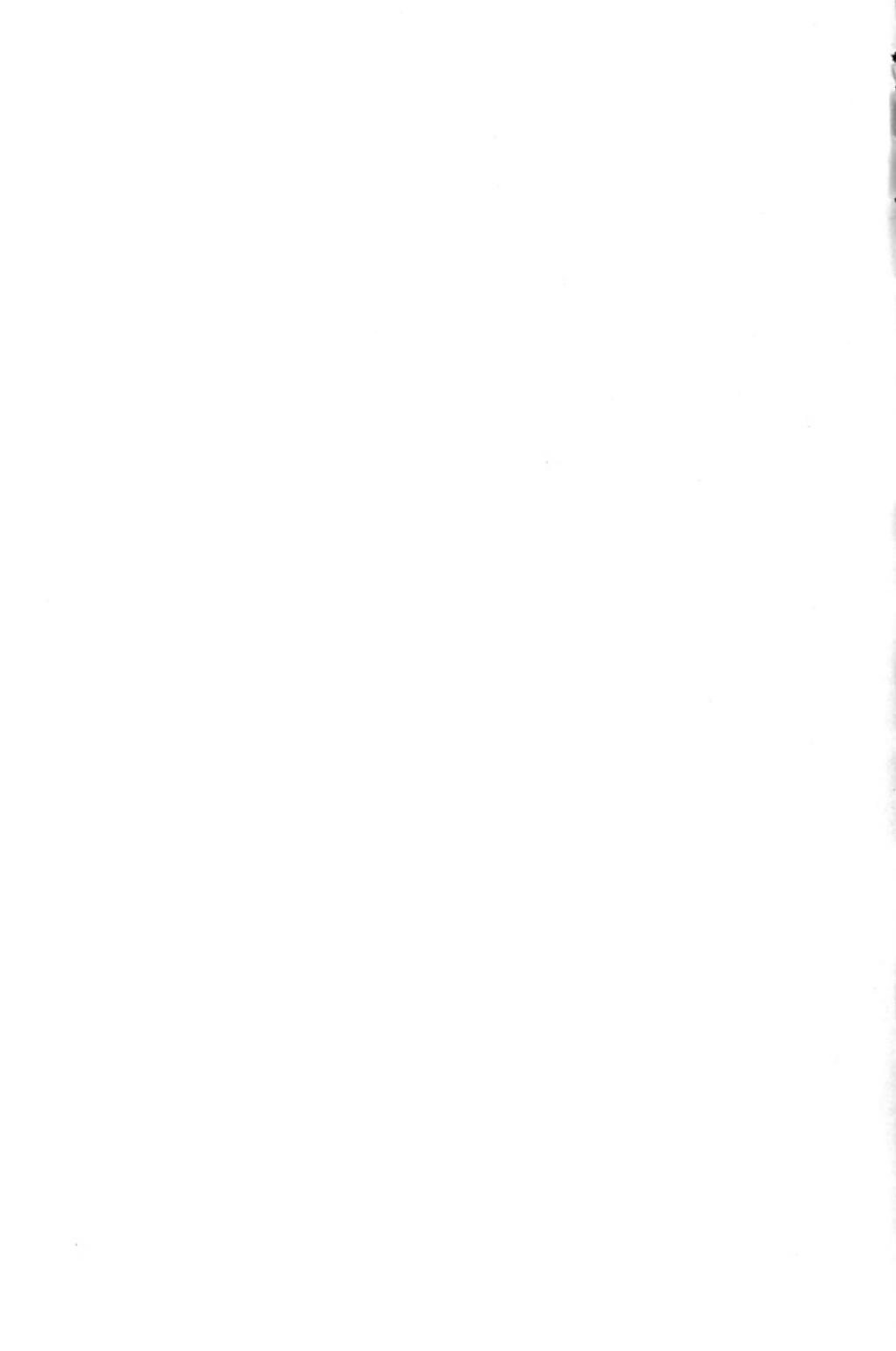
Plots 9, 14 and 24 are interesting, as they are the only ones (see pages 12, 18 and 14.) Also note the following: the cost of fertilizers, and the amount made. You will observe, referring to page 8, that some of the plots had as much as \$52, \$62, \$72 and \$86 worth of fertilizers (calculated upon them, and by the minus sign before the amount) and the cost of production was that much greater than the net worth. Plot 8.

### PLOT 7A.

60 lbs. Acid Phosphate.  
24 " Sulphate of Potash.  
20 " Nitrate of Soda.  
200 " Lime.

Yield 204 bushels per acre.  
Sold at 50 cents per bushel.

Net gain \$28.87. 100.77.



200 lbs. Lime.

Yield 95.5 bushels per acre.

Sold at 50 cents per bushel.

Net gain \$21.25 3.25

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EXPLANATORY.

Since local conditions are so variable and such wide differences in the cost of transportation, nothing more than an approximate value can be placed upon the fertilizing materials upon the market.

As a rule, in and around Tuskegee, nitrogen, phosphoric acid and potash may be had at the following prices. (This is for high-grade fertilizers):

Nitrogen	16 $\frac{1}{2}$	cents per pound.
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Phosphoric Acid	5	" "
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Potash as Muriate	5	" "
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Potash as Sulphate	5	" "
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Note.—We are greatly indebted to the donors of the fertilizers for the five cuts.



In amending the soil for potato growing, I think it quite safe to say that the best treatment, 300 bushels per acre, is the application of the ordinary superphosphate, under the following varying conditions:

First.—A normally poor soil, and practically.

Second.—Owing to unavoidable reasons, the phosphate cannot be applied at the right time.

Third.—The plants were not quite the right variety.

Fourth.—The potato crop was raised in a region of the entire South; the average yield in that region about 37 bushels per acre.

#### NOTE.

This bulletin should be carefully studied by all who expect to grow potatoes, and the following rules observed:

- (a) Prepare the ground well, by turning it over from end to end, 12 inches deep with a good two-horse plow, harrowing and pulverizing well.
- (b) Plant, practically flat, in dry soils, as high ridges dry out too quickly.
- (c) Fertilize well with potash and phosphates, using but little nitrogen; constantly remembering that the preparation of the soil and the after cultivation (which must be done) is quite as much to do with successful potato growing as the fertilizers used.
- (d) And that potash and phosphates are indispensable to the highest development of the potato and all root crops.
- (e) That our average upland soils will be benefitted by a light dressing of lime—say 200 pounds to the acre.
- (f) Sulphate of potash seemed to be of no special value over the muriate.
- (g) That heavy dressings of fertilizers containing nitrogen are not necessary.

